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against the mathematical theory of determinants; the whole protest is directed solely against the special application of that theory to space. The logician must feel that there are just as many wonderful hyper-smells, hyper-hues, and hyper-tones as there are hyper-spaces, —to wit, none, so far as mathematical analysis can show him. There is, however, a most wonderful and most useful theory of determinants which can be applied to anything and everything distinguishable.

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THE WORLD-TREE OF THE TEUTONS.*

One of the least satisfactory portions of Professor De la Saussaye's valuable book on *The Religion of the Teutons* is that relating to the Askr Yggdrasil, or Tree of the World. His treatment of this myth is very brief and, at the end, he merely concurs in Müllenhoff's declaration that a perusal of the pertinent passages in our sources "can leave in the mind only the most incongruous ideas concerning the character of the world-tree."

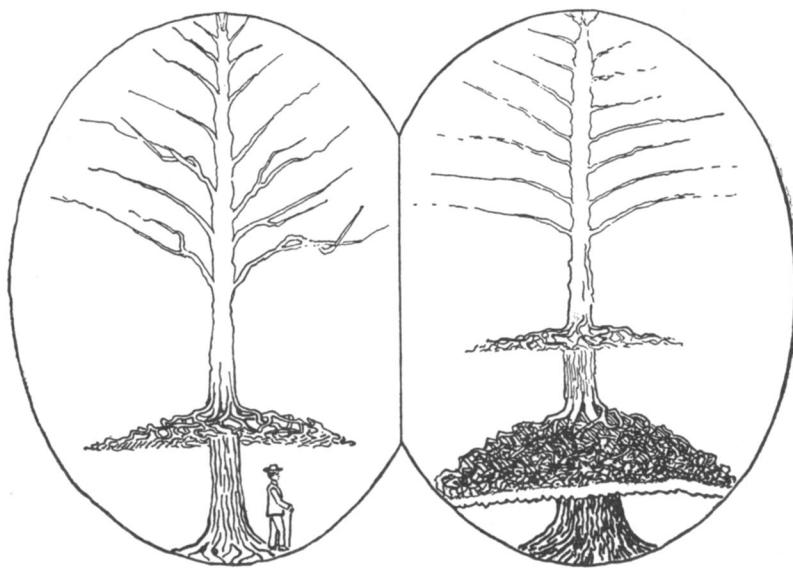
In my judgment two things go far toward explaining the admitted failure of experts in Teutonic mythology to reconstruct this tree in a way to harmonize with the literary data. The first is their reluctance to ascribe to the prehistoric authors of this and similar myths that power of thought and expression which they must have possessed. The second is forgetfulness of the high-north view-point of the oldest Teutonic, Keltic, and Slavonic, cosmological myths.

Once grant to the far-off authors of the Aryan mythologies a mental power adequate to conceive of their worlds celestial, terrestrial, and infernal, as all united in one organic unity, like the unity of a living tree, and we are entitled to look for something like rational fitness in their chosen symbol however poetic or artistic it may be. So, too, the moment we take, as we ought to do, a high-north view-point in visualizing the heavens and earth, we immediately find the world's axis substantially upright in position, and therefore easily seeming a column for the support of the dome of stars which revolves, as on a pivot at its head. This column, extending from visible zenith to lowest nadir of the universe furnishes

* For the information of our readers and for the proper identification of the author we wish to state that the writer of this paper was president of Boston University from 1873 to 1903 and as a scholar is mainly known in Oriental fields.

the one bond needed to give unity to all regions celestial, terrestrial, and infernal. It is the sacred Irminsul, *quod latine dicitur universalis columna, quasi sustinens omnia.*¹ It is the trunk of all world-trees. Generations ago this was clearly seen, and W. Menzel well said: "Dieses Symbol entsteht ursprünglich aus der Vorstellung der Weltachse."

The only important difficulty in picturing Yggdrasil in harmony with the mythological data is found in the account given of the "roots." The Edda itself interprets the branches, saying that they



THE OLDENBURG TREE
Showing a section of its aerial root-system.

THE YGGDRASIL
Triradically depicted.

"spread over the whole world and even reach above the sky." Of the "three roots," however, at least one seems to be represented as situated in a region naturally assigned to the branches. Among early interpreters, Ling evades the difficulty by suggesting that the Yggdrasil is merely a symbol of life, universal and human, and that the three roots symbolize the physical, the intellectual and the moral principles respectively. Another attempted explanation has taken the three to mean "matter, organization, and spirit." In Finn Magnussen's striking pictorial representation in his *Eddalæren*, Plate I, the first or lowest root is a root-system, the second a branch-system,

¹ Grimm, *Deutsche Mythologie*, p. 759.

and the third one knows not what. The picture is reproduced as frontispiece in Mallet's *Northern Antiquities*.

In a study of the cosmical tree in twelve mythologies, published in the year 1885,² I referred briefly to the Yggdrasil, and made "its midbranches inclose or overarch the abode of men." Not long after, however, on maturer consideration I reached a somewhat modified view, and one which still seems to me the true solution of the problem of the roots. As introductory to its presentation I would here first call attention to a noted *lusus naturæ* found in the chief cemetery of the city of Oldenburg. It is a tall and symmetrical tree with two systems of roots, one in the ground, and the other in the air. The upper one constitutes a kind of roof, about ten feet from the ground, and under it people walk about freely. A rude sketch of the tree is here presented. At the time of my visit to it I read the folklore tale which accounts for the prodigy by stating that once upon a time, when a falsely accused maiden was on her way to the place of her execution, she plucked up a small shrub and, giving it to the unmerciful mob of her persecutors, bade them plant it top downwards in the earth, assuring them that God would confirm her protestations of innocence by making it to grow with its roots in the air. According to what is now folk-faith her prophecy was fulfilled, and what was at first the taproot of the plant has become the trunk and beautiful top of a tall and shapely tree. A huge ring of roots is certainly there, high in the air, with only here and there a feeble leafstem struggling for life. As a permanent inscription on the main portal to the cemetery one reads to this day the words which the maiden's wicked, but afterward convicted and remorse-smitten accuser to his dying day repeated over and over: "*Die Ewigkeit ist lang! die Ewigkeit ist lang!*"

Now rings of roots, similar to the two systems on the Oldenburg tree, are not so rare as may be supposed. They are very often found at the base of a stalk of Indian corn (maize). On a hemlock in the woods I once found a kind of aerial guy-root. It started out from the tree as a branch, more than a foot above the ground. It then rooted itself close by in a high bank of earth, but after passing through this, it again became a branch, and flourished as a low bough of the mother tree. Any tree whose branches radiate at certain nodes like the spokes of a wheel, one set of them above another, would easily suggest to the imagination of a primitive people a continuation of the same system below the surface of the ground.

² *Paradise Found*. Boston, U. S. A., 11th ed., 1904, pp. 262-278.

In the light of the foregoing it is plain that a new and simple solution of the problem of the rooting of the Teutonic World-Tree can be had by making the three "roots" signify *root-systems*, the first and lowest being in the depths of hell, the second constituting the floor of the region in which men have their abode, and the third being situated just at the top of Cloudland, though still far below the starry abode of the immortal gods. This arrangement perfectly answers to the troublesome statement in the *Grimnismal*: "Hel dwells under one root, the frost-giants under the second, and the race of men under the third." See picture accompanying this paper.

Combining this new interpretation with that which I gave of Bifröst in pp. 155-158 of the work before referred to, and which identifies the bridges of Chinvat, Sirat, Bifröst, etc., with the axis-pillar of the universe, all further objects mythologically associated with Yggdrasil, such as the doomstead of the gods, the two swans, the eagle, the squirrel Ratatösk, the headspring of all the world's waters, the four harts, Nidhögg and the infernal serpents,—all take their appropriate places in the cosmos, and are found to have corresponding symbols in one or more of the world-trees of other mythologies. To the attention of interested scholars I confidentially commend it, stipulating only that they first read the recent account of the world-tree myths given in pp. 992-1018 of John O'Neill's *Night of the Gods*,—a work of immense erudition and of pathbreaking significance.

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SOME CURIOUS PSYCHOSENSORY RELATIONSHIPS.

Nearly every one associates with descriptive terms a more or less vivid imagery of the thing or quality denoted. Other people, however, there are who go beyond and possess sensory association values of a peculiar sort—the reference of color (psychic color) to things, words or qualifications outside the color series, or at least independent of any essential objective relationship to it.

And there may be auditory side issues. Some claim to perceive color values according to particular letter sounds, or symbols. Some claim to see color associations in the written characters, which of themselves may be indifferent. I think very few individuals associate sound, or definite musical tones, as predominant to a visual imagery.